

(12) UK Patent Application (19) GB (11) 2 303 945 (13) A

(43) Date of A Publication 05.03.1997

(21) Application No 9515579.2

(22) Date of Filing 28.07.1995

(71) Applicant(s)
James Goodfellow
4 Stonefield Crescent, PAISLEY, Renfrewshire,
PA2 7RU, United Kingdom

(72) Inventor(s)
James Goodfellow

(74) Agent and/or Address for Service
Fitzpatricks
4 West Regent Street, GLASGOW, G2 1RS,
United Kingdom

(51) INT CL⁶
G06F 3/02, H04B 10/10 10/22

(52) UK CL (Edition O)
G4A AFGDX AKS
H4B BK BK10 BK22

(56) Documents Cited
GB 2288044 A GB 2282907 A EP 0483549 A2
EP 0369188 A2 EP 0176959 A2

(58) Field of Search
UK CL (Edition O) G4A AFGDX AKS, H4B BK BKX
BK22 BK24, H4L LDA
INT CL⁶ G06F 3/02 13/38, H04B 10/00 10/22 10/24
ONLINE DATABASES: COMPUTER, INSPEC, WPI

(54) Remote infra red personal computer access

(57) There is disclosed a computer system providing remote access to a personal computer. The invention provides a computer system 5a comprising a computer 10a located in a first room 15a of a building, at least one input/output (I/O) device 55a located in a second room of a building and means for bidirectional communication between the computer and the at least one I/O device 55a. In a preferred embodiment the computer 10a is a personal computer, the building is a domestic residence and the communication means are at least partly wireless, and advantageously, comprise Infra Red (IR) 70a or ultrasonic signalling means. The I/O device may comprise a portable display unit having either a touch sensitive screen or a track ball for data entry and an IR transceiver 75a. IR repeater transceiver units may be used and an IR level testing device is disclosed for ensuring a sufficient signal level for the remote access network.

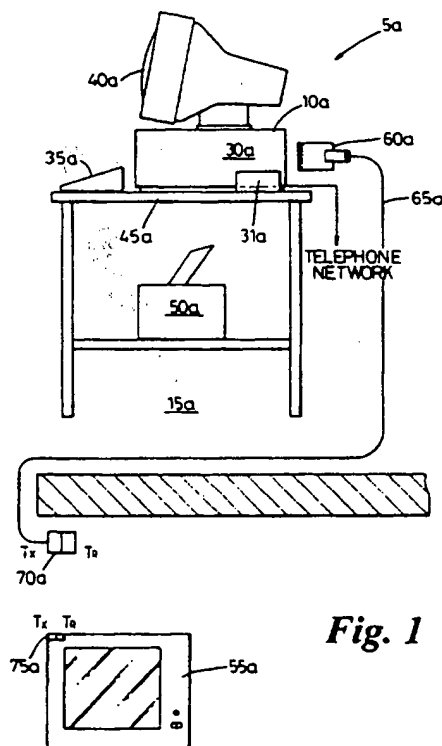


Fig. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

GB 2 303 945 A

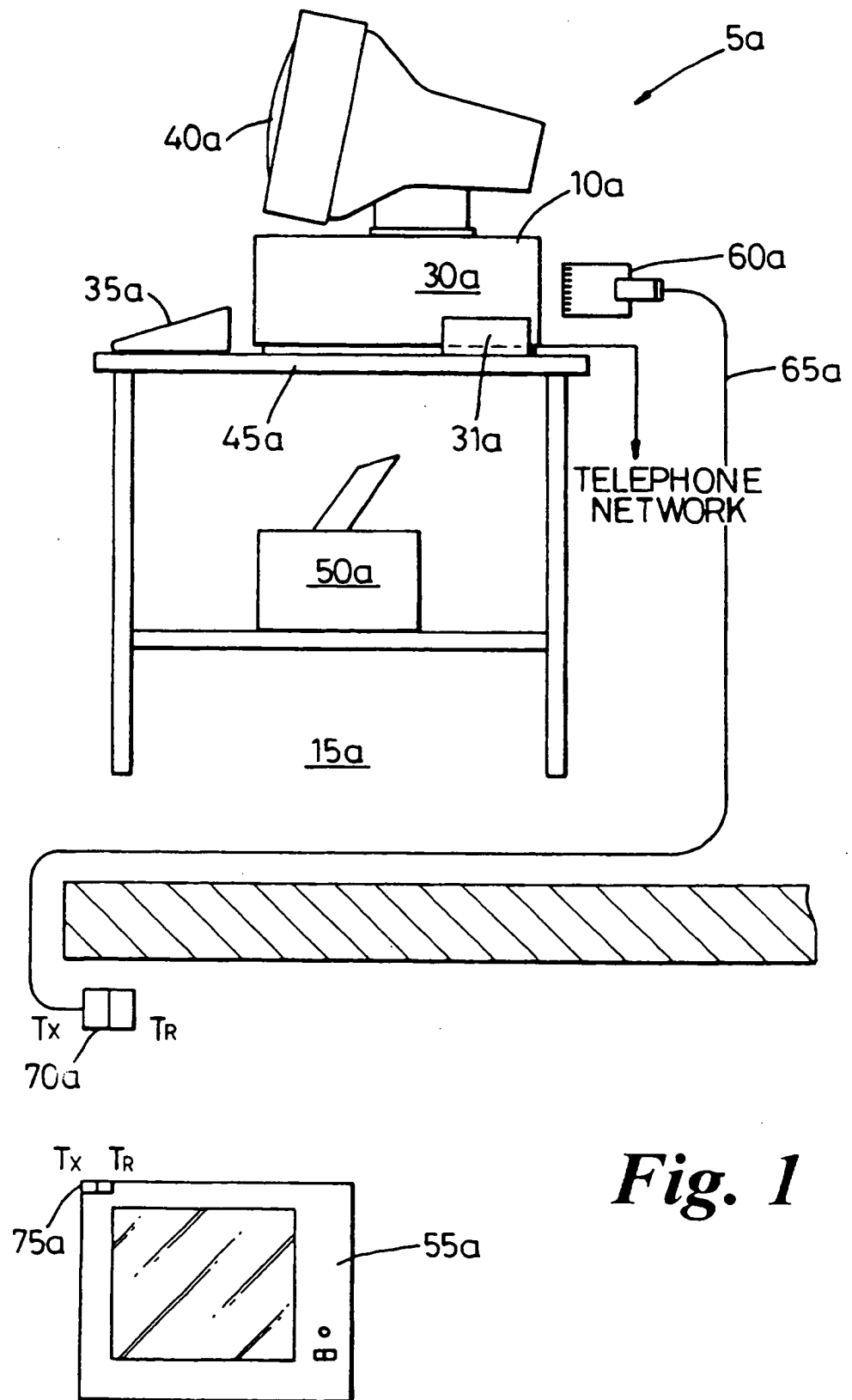


Fig. 1

2/14

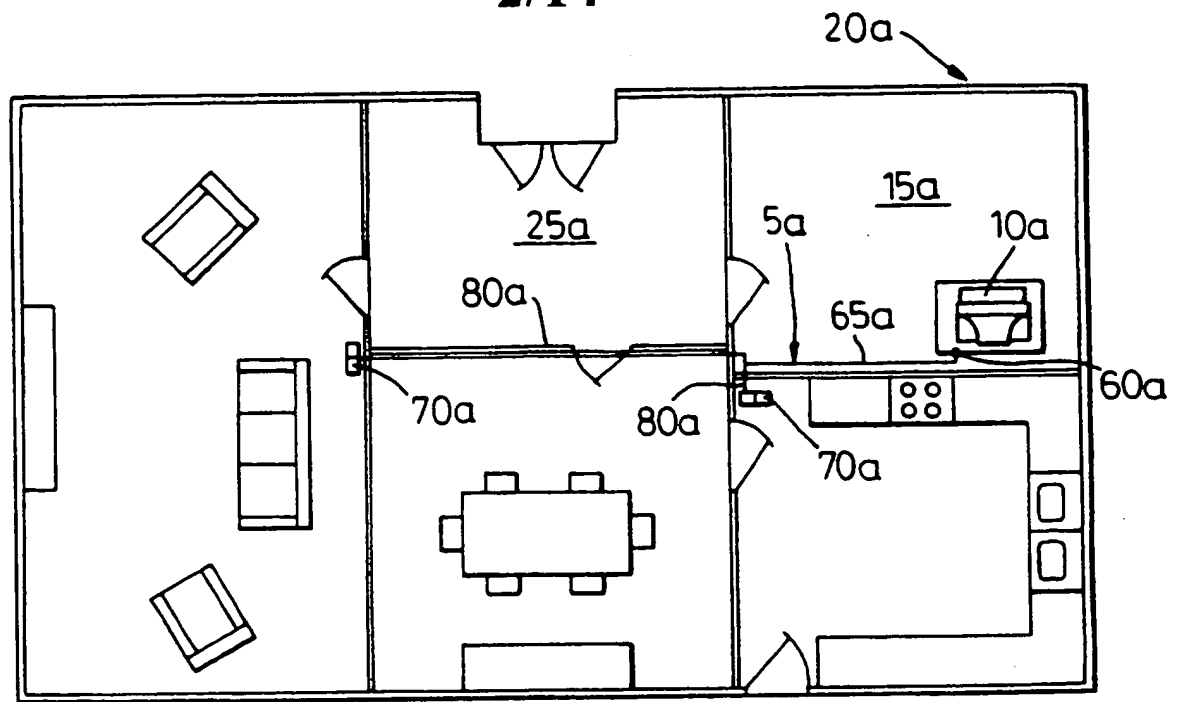


Fig. 2

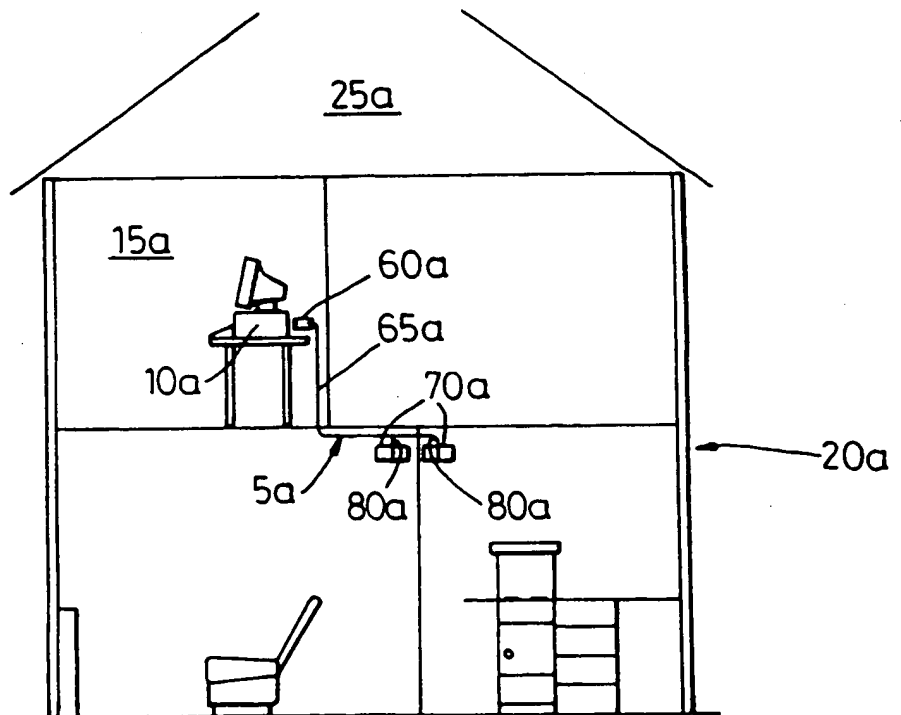


Fig. 3

3/14

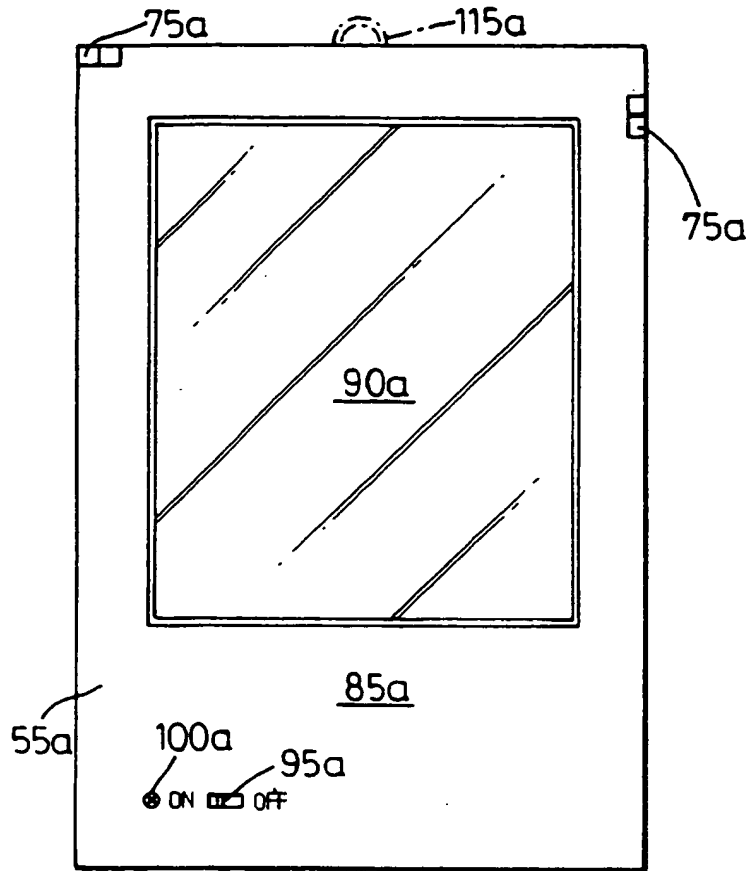


Fig. 4(A)

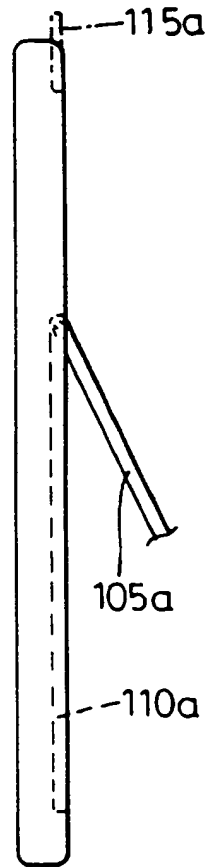


Fig. 4(B)

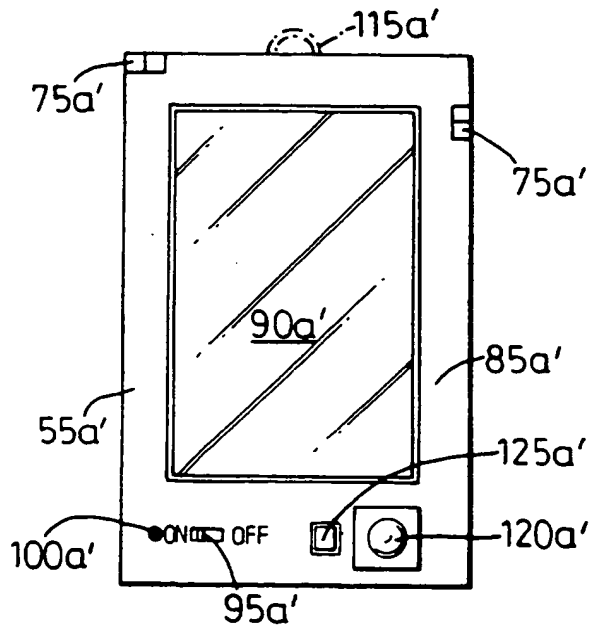


Fig. 5(A)

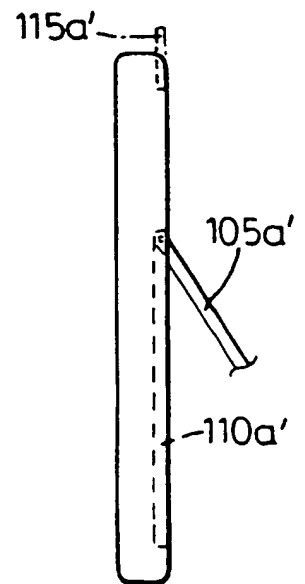
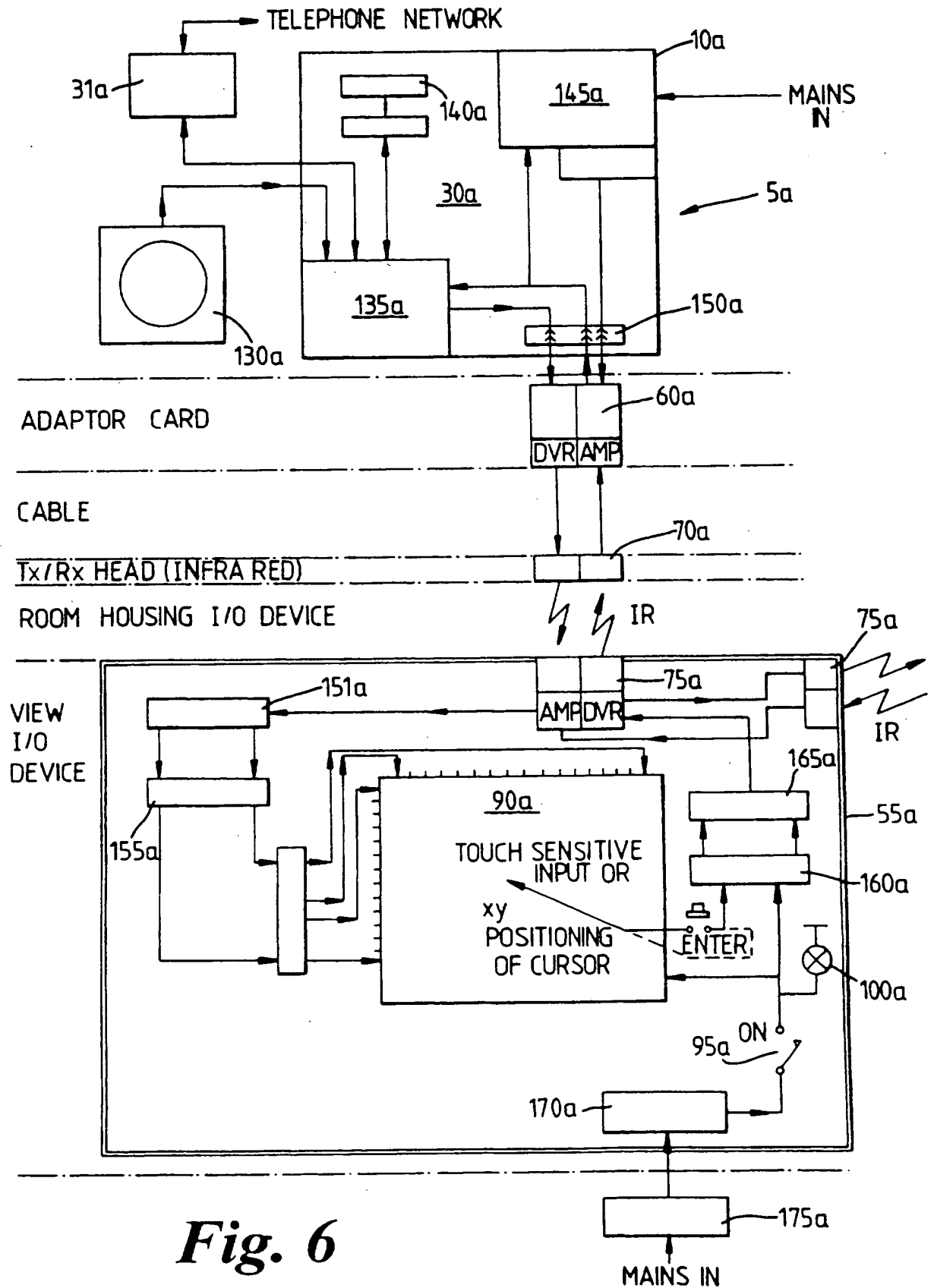


Fig. 5(B)

**Fig. 6**

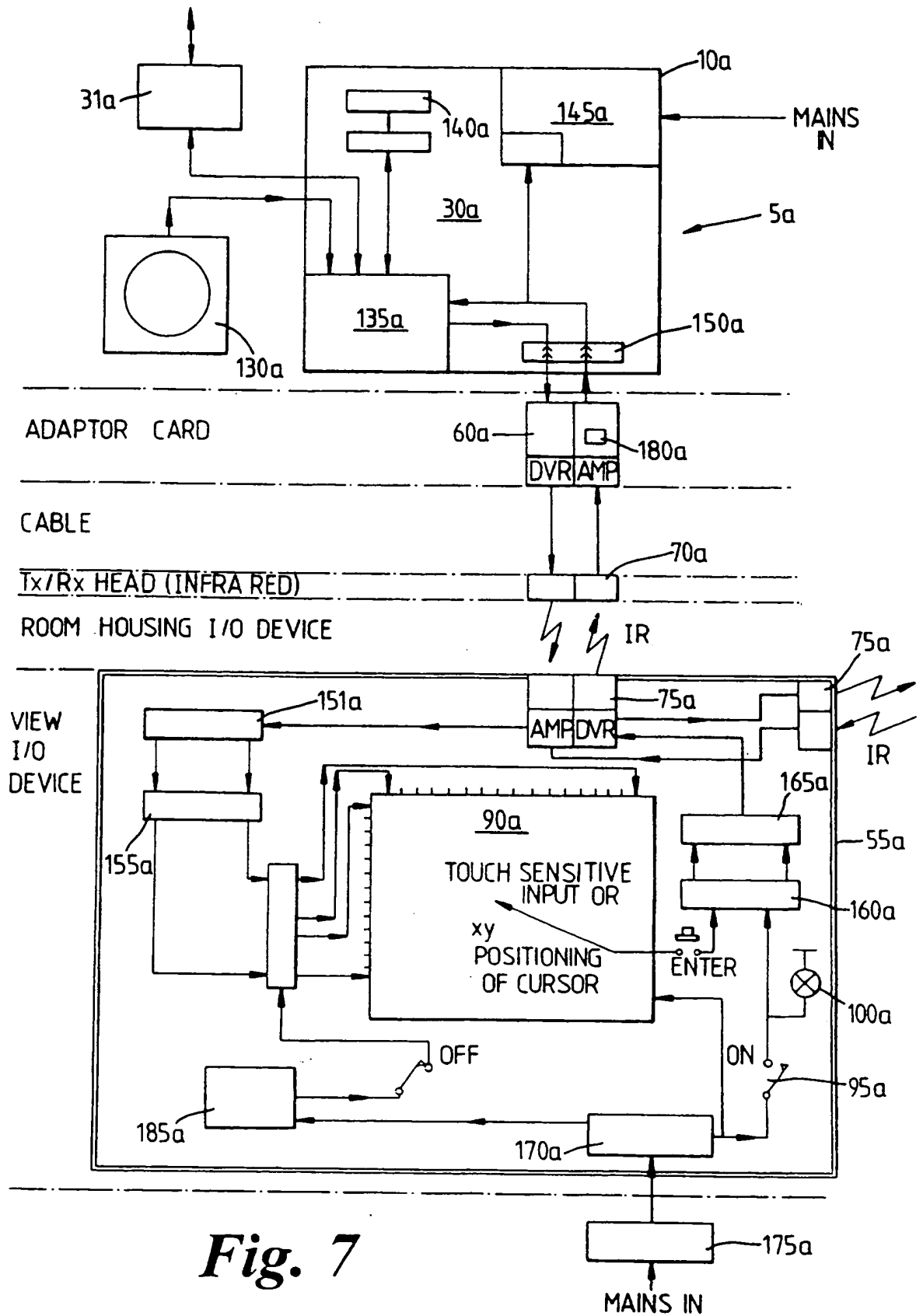


Fig. 7

6/14

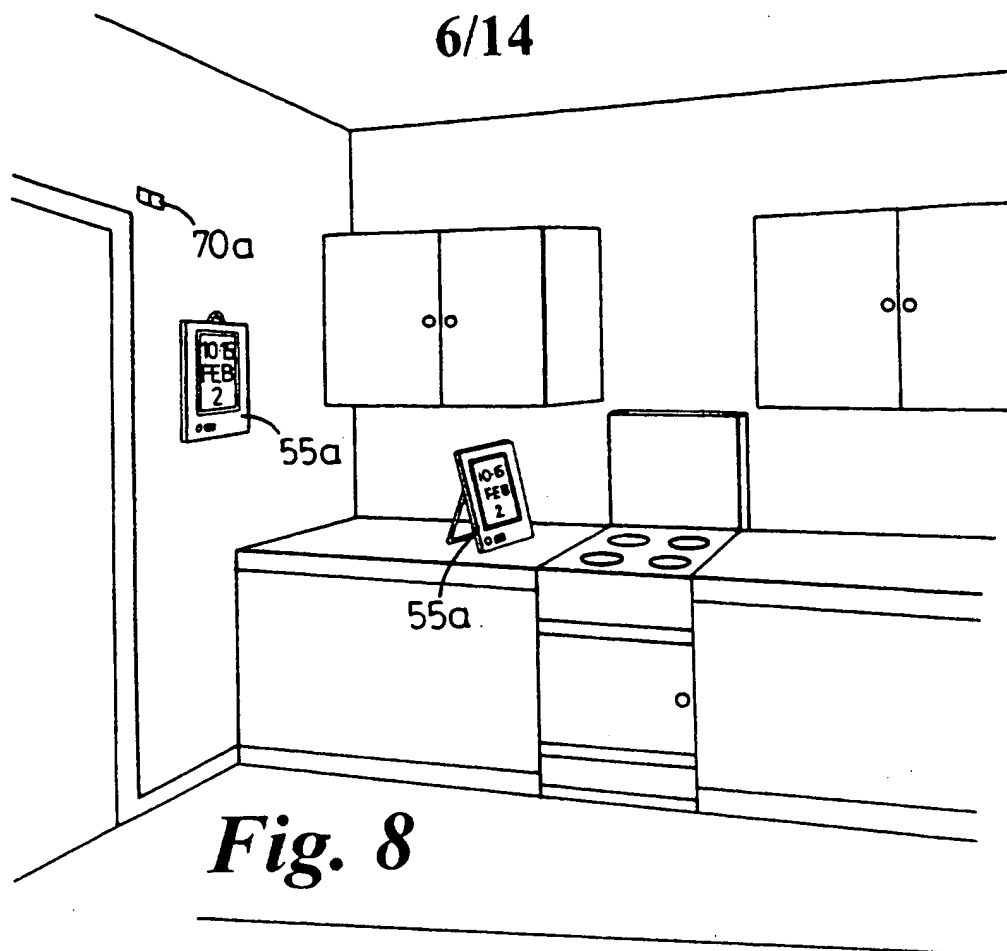


Fig. 8

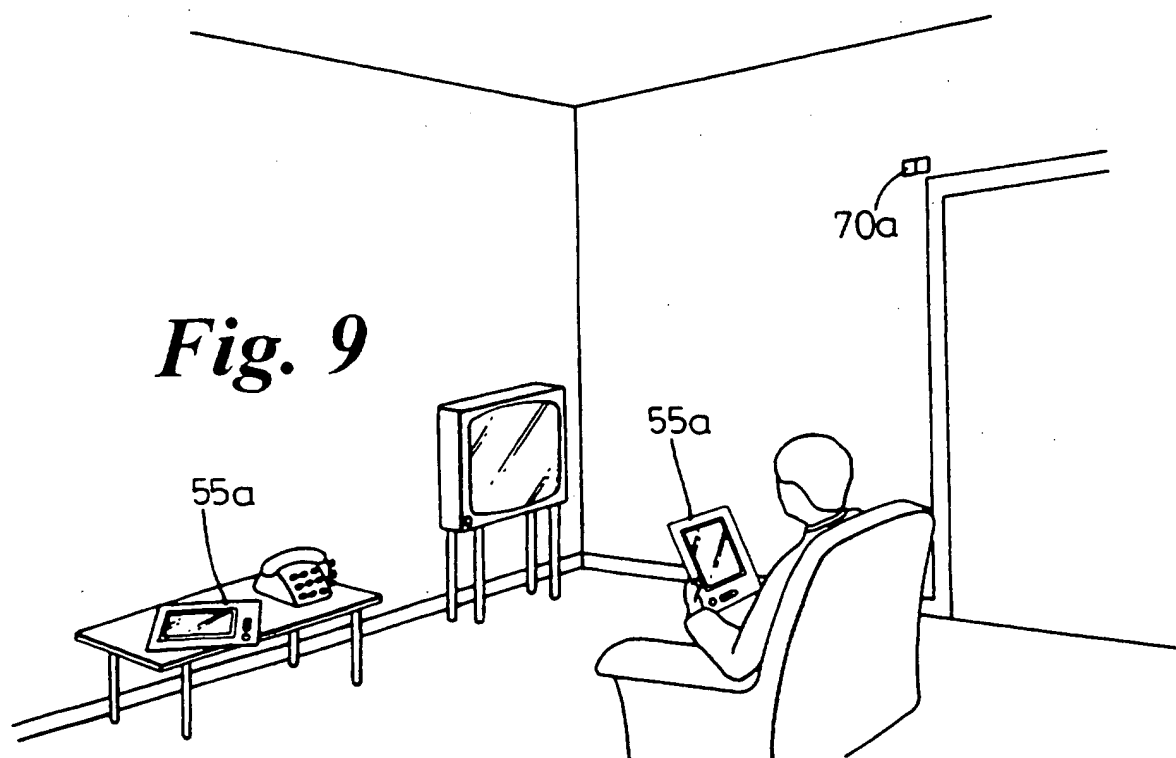


Fig. 9

8/14

MAIN MENU

<input checked="" type="checkbox"/> DIARY	GAMES
TELEPHONE	LITERATURE
COOKING	INTERNET
SHOPPING	CALCULATOR

(A)

THURS SEPT 14.95

MORN -ING	
AFTER -NOON	
EVEN -ING	

ENTER DETAILS

Q W E R T Y

END PRINT

(D)

DIARY

JAN	JULY
FEB	AUG
MAR	<input checked="" type="checkbox"/> SEPT
APRIL	OCT
MAY	NOV
JUNE	DEC

SELECT MONTH

(B)

Fig. 11

SEPT 95

MON		4	11	18	25
TUES		5	12	19	26
WED		6	13	20	27
THURS		7	<input checked="" type="checkbox"/> 14	21	28
FRI	1	8	15	22	29
SAT	2	9	16	23	30
SUN	3	10	17	24	

SELECT DAY

(C)

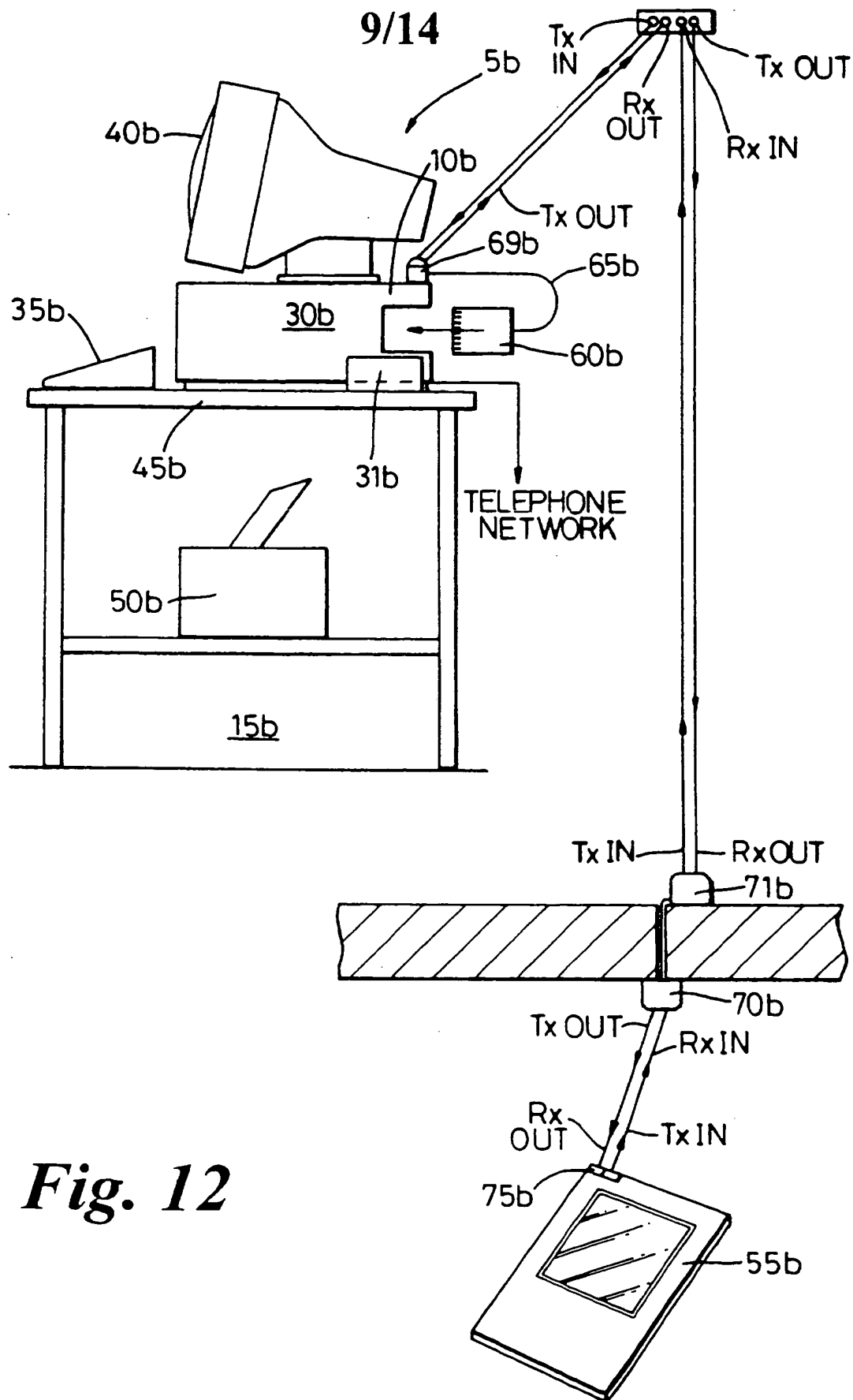


Fig. 12

10/14

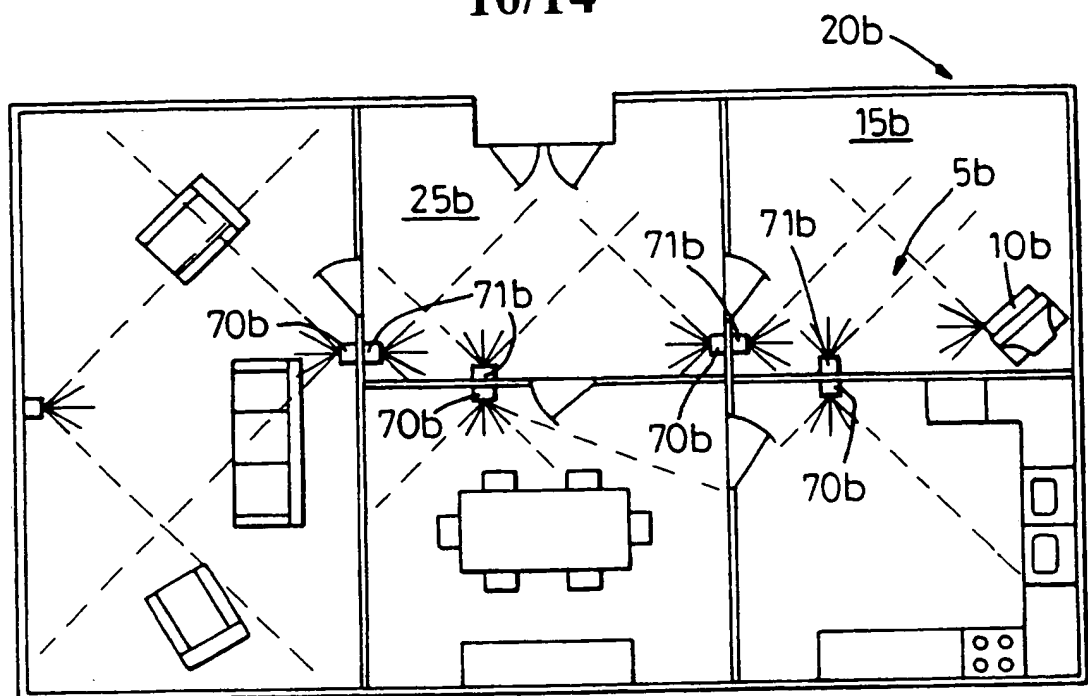


Fig. 13

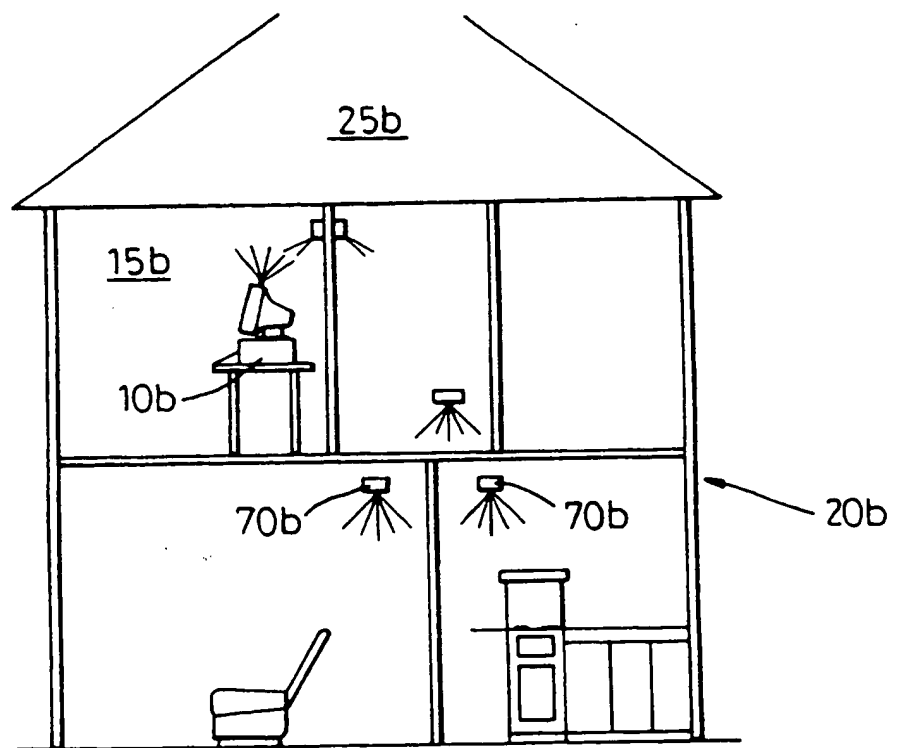


Fig. 14

11/14

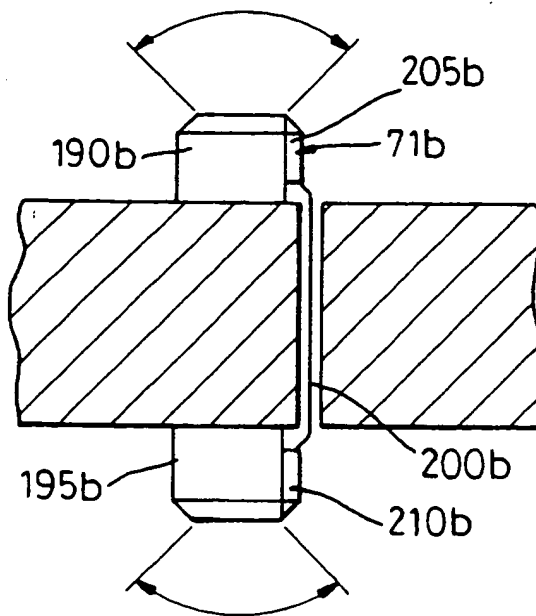


Fig. 15(A)

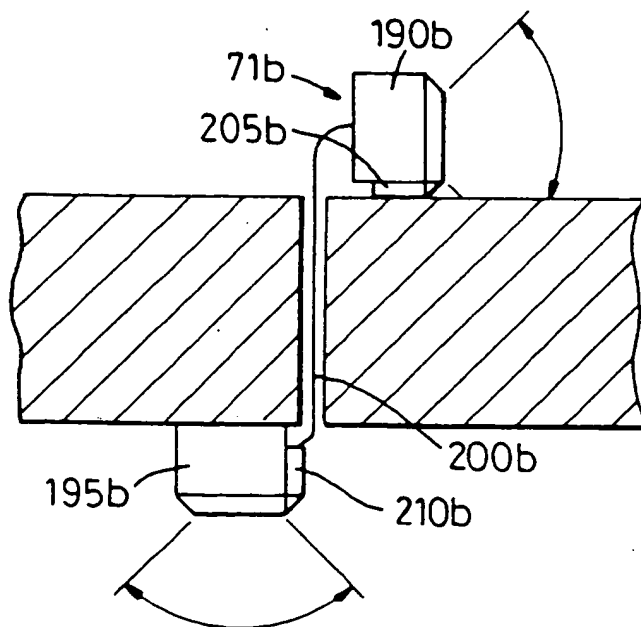


Fig. 15(B)

12/14

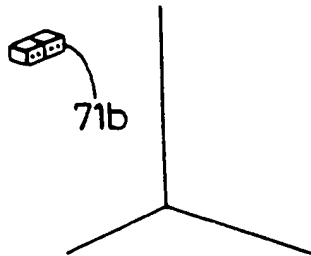
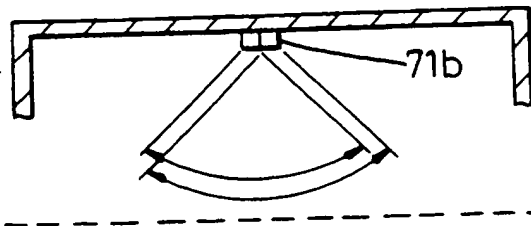


Fig. 16(A)

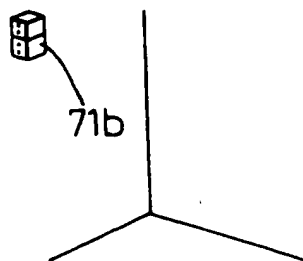
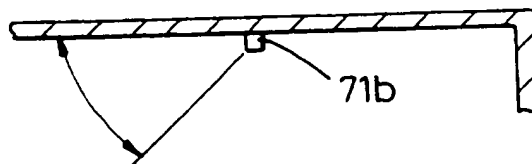


Fig. 16(B)

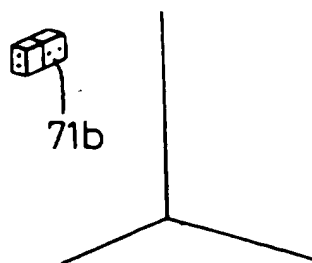
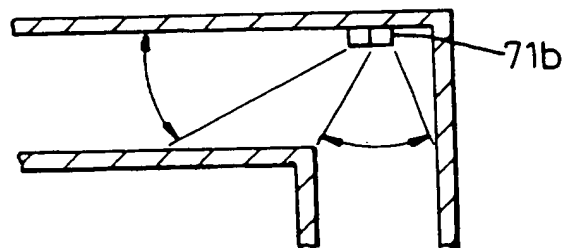


Fig. 16(C)

13/14

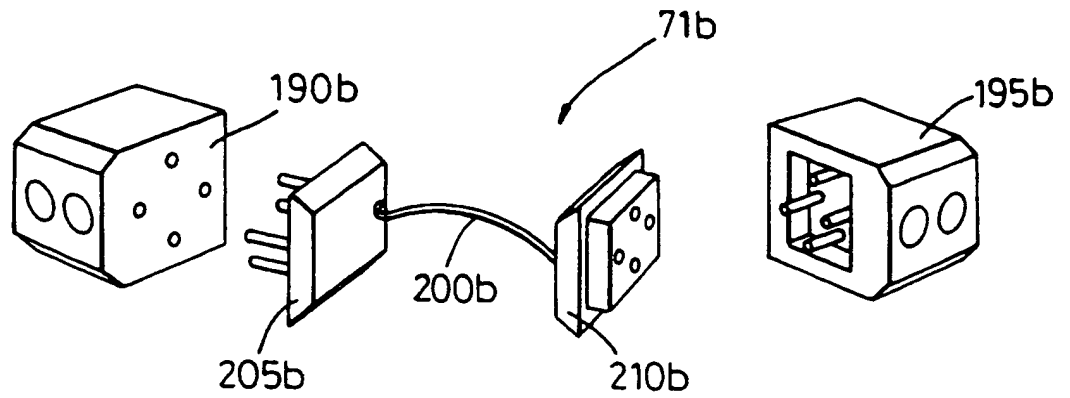


Fig. 17

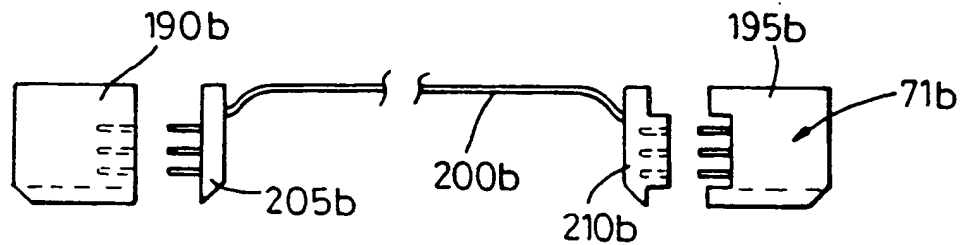


Fig. 18

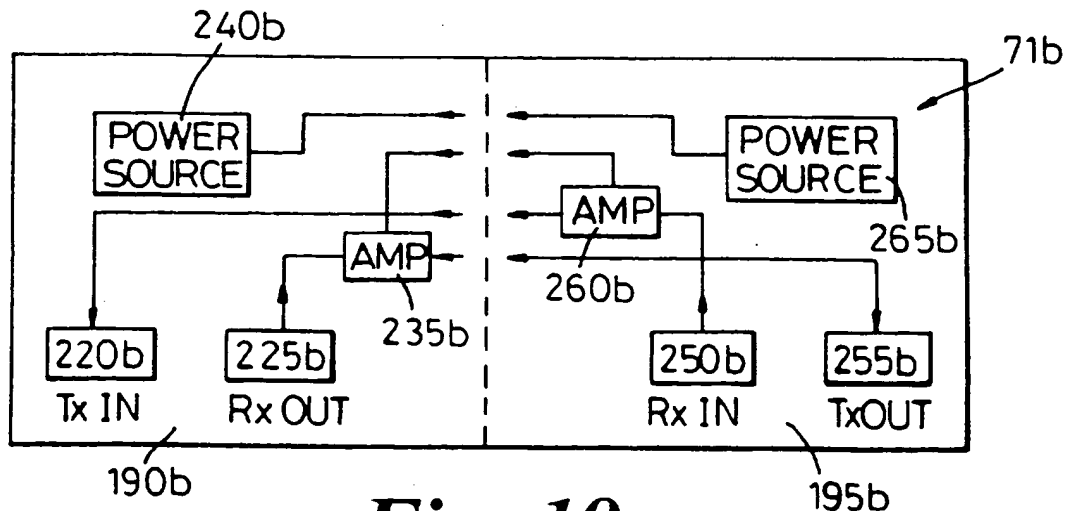


Fig. 19

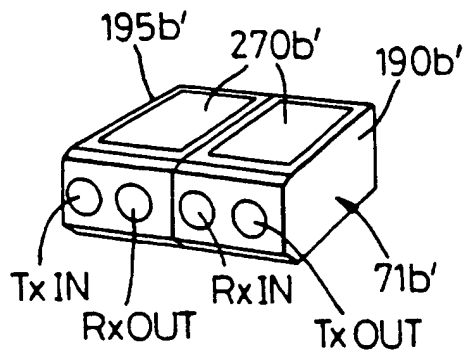


Fig. 20(A)

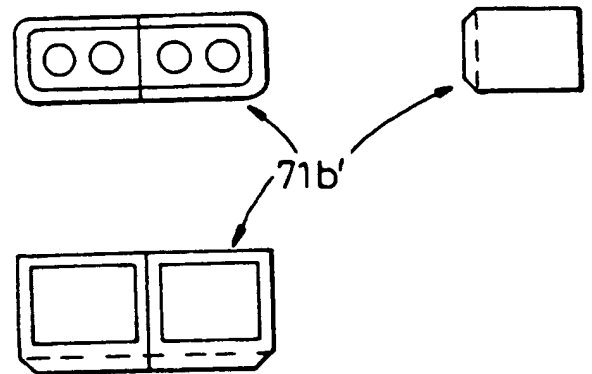


Fig. 20(B)

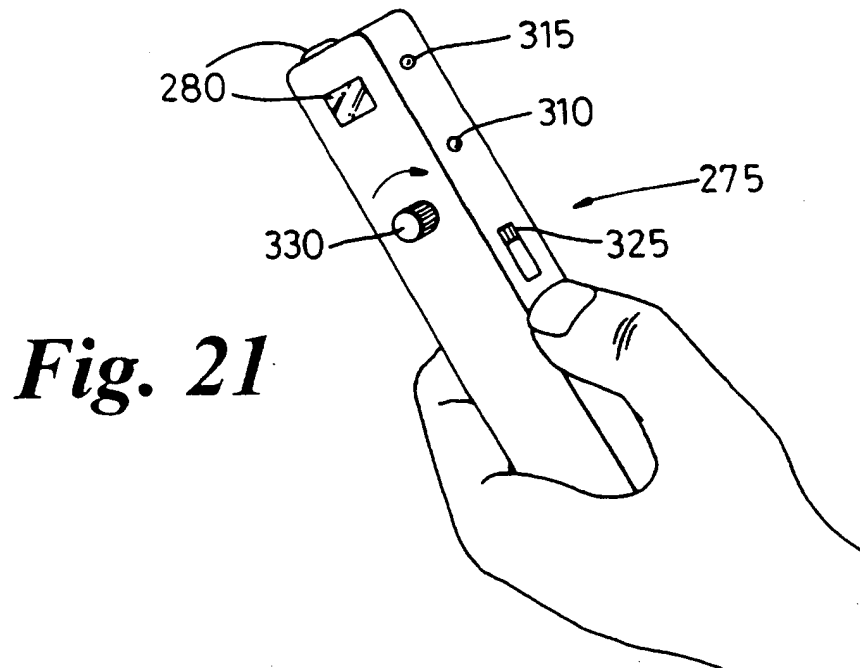


Fig. 21

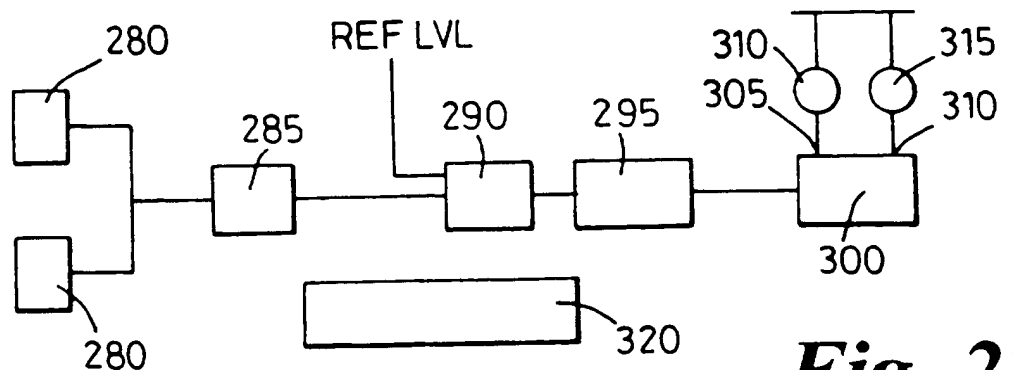


Fig. 22

Improvements In or Relating to Computers

5 This invention relates to computers, and in particular to a system providing remote access to a personal computer.

10 An increasing number of homes have a personal computer (PC). To operate a PC in the normal manner, one employs the man/machine interface of keyboard input and visual display unit (VDU) output. If these are not an integral part of the PC, then they are usually sited in close proximity thereto. It follows that to use the PC in the home one must go to the room in which the PC is located. This room is likely not to be the living room or the kitchen, these being the rooms in which a family
15 tend to spend most of their time, but is more likely to be a study or a spare bedroom. Thus a problem exists in access to PC's.

20 It is an object of the present invention to obviate or mitigate the aforementioned problem in the prior art.

It is a further object of the present invention to provide a user with access to a computer from rooms other
25 than that in which the computer is located.

According to a first aspect of the present invention there is provided a computer system comprising a computer located in a first room of a building, at least one
30 input/output (I/O) device located in a second room of a building and means for bidirectional communication between the computer and the at least one I/O device.

35 The computer may be a personal computer (PC).

The building may be a domestic residence.

The communication means are preferably at least partly wireless.

Accordingly, the communication means may use
5 ultrasonic signalling means, RF signalling means or, advantageously, Infra Red (IR) signalling means.

In a first embodiment of the system of the present invention, an input/output port of the PC is connected to
10 a cable which cable runs from the first room to the second room and is connected to an IR transmit/receive unit in the second room, which unit can bidirectionally communicate with another IR transmit/receive unit which other unit comprises part of the at least one I/O device.

15

In a second embodiment of the system of the present invention, an input/output port of the PC is connected to a first IR transmit/receive unit in the first room which unit can bidirectionally communicate with a second IR
20 transmit/receive unit in the second room via one or more IR repeater transmit/receive units, the second unit bidirectionally communicating with another IR transmit/receive unit which other unit comprises part of the at least one I/O device.

25

The PC may be adapted to provide a standby (powered-down) mode and may be remotely powered-up and powered-down via the at least one I/O device.

30

The PC may include an expansion adaptor card connected to the input/output port.

The adaptor card may be provided with a battery.

35

According to a second aspect of the present invention there is provided an input/output (I/O) device adapted to form part of a computer system, the system comprising a computer located in a first room of a

building, the I/O device being, in use, located in a second room of the building and means for bidirectional communication between the computer and the I/O device.

5 The I/O device may be hand-held.

 The I/O device may comprise a substantially planar body, which body may be of substantially A4 size.

10 The I/O device may be provided with an LCD display, which may be colour or mono.

 The LCD display may provide a touch sensitive input.

15 The I/O device may provide input means in the form of a trackball and an enter switch.

 The I/O device may be provided with an IR transmit/receive unit.

20 According to a third aspect of the present invention there is provided a device for testing a computer system, the system comprising a computer located in a first room of a building, at least one I/O device located in a
25 second room of the building and means for bidirectional communication between the computer and the at least one I/O device, wherein the communication means provides at least two IR transmit/receive units, the test device comprising an IR receive unit and means for detecting and
30 displaying a set signal level received from one of the at least two IR transmit/receive units.

 Embodiments of the present invention will now be described by way of example only with reference to the
35 accompanying drawings, which are:

- Fig 1 a partial schematic view of a first embodiment of a computer system according to the present invention;
- 5 Fig 2 a schematic plan view of the computer system of Fig 1 installed in a domestic residence;
- 10 Fig 3 a schematic side view of the computer system of Fig 1 installed in the domestic residence of Fig 2;
- 15 Fig 4(A) a front view of a first embodiment of an input/output (I/O) device according to the present invention;
- Fig 4(B) a side view of the input/output device of Fig 4(A);
- 20 Fig 5(A) a front view of a second embodiment of an I/O device according to the present invention;
- 25 Fig 5(B) a side view of the input/output device of Fig 5(A);
- 30 Fig 6 a simplified schematic circuit diagram of the computer system of Fig 1;
- Fig 7 a simplified schematic circuit diagram of an improved version of the computer system of Fig 1;
- 35 Fig 8 a schematic view of the input/output device of Fig 4(A) in use in a kitchen;

- Fig 9 a schematic view of the input/output device of Fig 4(A) in use in a living room;
- 5 Figs 10(A) - (F) a series of menu displays which may be shown on an LCD panel provided on the input/output device of Fig 4(A);
- 10 Figs 11(A) - (D) a series of views showing the LCD display in use as a diary;
- Fig 12 a partial schematic view of a second embodiment of a computer system according to the present invention;
- 15 Fig 13 a schematic planar view of a computer system of Fig 12 installed in a domestic residence;
- 20 Fig 14 a schematic side view of the computer system of Fig 12 installed in the domestic residence of Fig 13;
- 25 Figs 15(A) - (B) schematic views of IR repeater transmit/receive units for use in the computer system of Fig 12;
- 30 Figs 16(A) - (C) various mounting arrangements for IR repeater transmit/receive units for use in the computer system of Fig 12;
- Fig 17 a perspective view of a first embodiment of an IR repeater transmit/receive unit for use in the computer system of Fig 12;
- 35 Fig 18 a plan view of the unit of Fig 17;

- Fig 19 a schematic circuit diagram of the IR repeater transmit/receive unit of Fig 17;
- 5 Fig 20(A) a perspective view of a second embodiment of an IR repeater transmit/receive unit for use in the computer system of Fig 12;
- 10 Fig 20(B) a series of views of the unit of Fig 20(A);
- Fig 21 a perspective view of a test device for use with a computer system according to the present invention;
- 15 and
- Fig 22 a simplified circuit diagram of the test device of Fig 21.

20

Referring firstly to Figs 1 to 3 there is illustrated a first embodiment of a computer system, generally designated 5a, comprising a computer 10a located in a first room 15a of a building 20a.

25

In this embodiment the computer 10a is a personal computer (PC), located in a room 15a such as a study or spare room of a domestic residence 25a. The computer 10a comprises a conventional system unit 30a, an input device in the form of a keyboard 35a and an output device in the form of a Visual Display Unit (VDU) 40a. The VDU 40a may further function as an input device if the screen of the VDU 40a is touch sensitive. The computer 10a may be provided on a computer desk 45a, and suitably connected to a printer 50a. The system unit 30a may be connected to a modem 31a which allows the computer 10a access to an external telephone network.

30

35

The computer system 5a, further comprises at least one input/output (I/O) device 55a located, in use, in a second room of the building of the residence 25a. Further the computer system 5a comprises means for bidirectional communication between the computer 10a and the at least one input/output device 55a. The bidirectional communication means will be described in more detail hereinafter.

In this first embodiment of the computer system 5a, an input/output port of the PC 60a is connected to a cable 65a, which cable 65a runs from the first room 15a to the second room and is connected to an Infra Red (IR) transmit/receive unit 70a, which unit 70a can bidirectionally communicate with another IR transmit/receive unit 75a, which other unit 75a comprises part of the at least one I/O device 55a.

As can be seen from Figs 2 and 3, the cable 65a has a plurality of branches 80a connected to IR transmit/receive units 70a in more than one second room.

Referring now to Figs 4(A) and 4(B), there is illustrated a first embodiment of an I/O device 55a, intended to form part of the computer system 5a. The I/O device 55a is capable of being hand-held, and comprises a substantially planar member in the form of a body 85a, which body 85a is of substantially A4 size. The I/O device 55a provides at least one IR transmit/receive unit 75a and an LCD display panel 90a. The LCD panel 90a may be colour or mono chrome. The I/O device 55a may also provide a sound output facility, eg in the form of a loudspeaker (not shown). The I/O device 55a further comprises an on/off switch 95a and an LED indicator 100a which illuminates when the switch 95a is at an on position. The I/O device 55a provides a hinged stand 105a on a rear surface thereof, which stand 105a may be

pulled out from a recess 110a on the rear surface of the I/O device 55a. Provision of the stand 105a allows a user to stand the device 55a on a horizontal surface. The I/O device 55a further provides a hanger 115a on an upper edge thereof, which hanger 115a may be used to hang the I/O device 55a from a hook or the like provided, for example, on a wall.

Referring now to Fig 5(A) and 5(B) there is illustrated a second embodiment of a I/O device 55a' for use in a computer system according to the present invention. Like parts of this I/O device 55a' are identified by the same numerals as used to describe the I/O device of Figs 4(A) and 4(B) but suffixed with a "'". The I/O device 55a' is substantially identical to the I/O device 55a. However, the I/O device 55a' rather than having input means in the form of a touch sensitive LCD screen 90a is provided with a track ball 120a' and an enter key 125a'.

Referring now to Fig 6, there is illustrated a schematic circuit diagram of the computer system 5a of Fig 1. As can be seen from Fig 6, the computer 10a may also be connected to CD ROM drive 130a. The system unit 30a essentially comprises a CPU 135a, a hard disk drive unit 140a, a power supply unit 145a connected to an expansion slot 150a which is connected to the adaptor card 60a. Bi-directional communications between the system unit 30a and the I/O device 55a is provided as hereinbefore described.

The I/O device 55a provides the at least one IR transmit/receive unit 75a connected to a serial parallel buffer 151a which buffer 151a is connected to a decoder 155a, which is in turn connected to the LCD 90a. In this way information can be communicated from the system unit 30 to the I/O device 55a.

The I/O device 55a communicates with the system unit 30a via the touch sensitive LCD 90a (or the trackball 120a' and enter key 125a'), an encoder 160a, parallel to serial buffer 165a and IR transmit/receive unit 75a.

5

The I/O device 55a may be powered by means of a battery 170a, which battery 170a may be of the rechargeable type, and may be charged by a conventional charger 175a.

10

Referring to Fig 7 there is illustrated an improvement to the computer system 5a of Fig 6. In the improved computer system 5a, the adaptor card 60a is provided with an internal battery 180a. Further, the input/output device 55a is provided with a clock calendar chip 185a.

Referring to Fig 8 there is illustrated how an input/output device 55a could be used in a kitchen to access information stored in files on the computer 10a. Such information may comprise a shopping list(s), as illustrated in Figs 10(A)-(F) or may, for example, comprise information relating to recipes or the like.

Referring to Fig 9 there is illustrated how an input/output device 55a could be used in a living room to access information stored in files on a computer 10a. In this instance information may, for example, comprise a telephone number(s) which is/are desired to be accessed from the computer 10a or may, for example, comprise newspaper text, accessed via the external telephone network. Alternatively, the information may comprise diary information as illustrated in Figs 11(A)-(D).

In use, on switching on switch 95a the I/O device 55a generates a coded pulse train which is transmitted to the PC 10a (which is in Standby Mode). On decoding this signal, the PC 10a powers-up and the CPU 135a,

recognising the demand from the I/O device 55a responds by sending the "Main Menu" data to the I/O device as illustrated in Fig 10(A), via the adaptor card 60a, cable 65a and IR transmit/receive units 70a, 75a. The LCD 90a
5 within the I/O device 55a then displays the "Main Menu", which contains all the first level options available to the user.

The user selects the desired item, or function, by
10 touching it on the screen 90a (or by cursor selection trackball and enter button 120a', 125a'). This signal is then encoded and sent to the PC 10a. Using a specially written pre-stored program, the PC 10a provides the data requested from its appropriate storage area or device or
15 executes the requested function, eg. print, end transaction, save etc.

To allow alpha-numeric input, a keyboard or keypad may be displayed on the LCD 90a enabling, for instance, a
20 "calculator" mode to be utilised.

Thus dialogue between the user and the PC 10a is carried on, putting the power and capability of the PC 10a into the hands of the user, situated where he wants
25 and needs to be, rather than going off to have a "session" on the PC 10a in the first room 15a.

On completion of the transaction, switching off switch 95a also powers-down the PC 10a, leaving it in
30 "Standby Mode", ready to receive a new start signal when one is generated.

On existing PCs 10a which do not have a "Standby Mode", either the PC 10a requires to ON prior to the
35 start of the transaction, or the adaptor card 60a may contain a battery 180a providing power for the IR transmit/receive device 70a and decoder which on identifying the start signal can trigger a "Triac" type

switch in series with the PC mains input which would then power-up the PC 10a. However, since the VDU 40a is not required, it may be inhibited in this mode.

5 Supporting software may provide additional facilities at the PC 10a. For instance, in the "SHOPPING LIST", the user may previously designate which goods come from which shop and also in which order they may be found in that particular shop, eg, entering "butter" at the I/O
10 device 55a, the PC 10a would assign it to "SAFEWAY" as designated, and place it after "milk" and before "cheese". In this way a user need only type in what goods he/she wishes to purchase, and the software sorts the list of goods into order, ie. which shop the user may
15 find such goods, and also the order in which goods are to be found in the shop(s) of interest.

The "TELEPHONE DIRECTORY" could be compiled at the PC 10a using the keyboard and a regular Database program.

20

The "DIARY" feature could be pre-formatted but entries could be made at the I/O device 55a using menu selection. It could be envisaged that icons could be defined by the user as a shorthand method of making
25 regular entries, eg. golf and bridge come to mind.

Print can be commanded from the I/O device 55a, eg. "Shopping List", or "Things to Do", or day, or week of "DIARY". However, having made the request from the I/O
30 device 55a, the user must go to the room where the printer 50a is located to remove the hardcopy.

Since the I/O device 55a has no "hard" keyboard, it is envisaged that keyboard intensive tasks like
35 wordprocessing will still likely be carried out at the PC 10a. The software may alternatively allow a keyboard to be displayed on touch sensitive LCD 90a.

Referring now to Figs 12 to 14 there is illustrated a second embodiment of a computer system, generally designated 5b, comprising a computer 10b located in a first room 15b of a building 20b.

5

In this embodiment the computer 10b is a PC, located in a room 15b such as a study or spare room of a domestic residence 25b. The computer 10b comprises a conventional system unit 30b, an input device in the form of a keyboard 35b and an output device 40b in the form of a VDU 40b. The VDU 40b may further function as an input device if the screen of the VDU 40b is touch sensitive. The computer 10b may be provided on a computer desk 45b and suitably connected to a printer 50b. The system unit 30b may be connected to a modem 31b which allows the computer 10b access to an external telephone network.

The computer system 5b, further comprises at least one input/output (I/O) device 55b located, in use, in a second room of the building of the residence 25b. Further the computer system 5b comprises means for bidirectional communication between the computer 10b and the at least one input/output device 55b. The bidirectional communication means will be described in more detail hereinafter.

In this second embodiment of the computer system 5b, an input/output port of the PC 60b is connected to a cable 65b, which cable 65b is connected to an IR transmit/receive unit 69b in the room 15b. The unit 69b can bidirectionally communicate with a second IR transmit/receive unit 70b, in the second room via one or more IR repeater transmit/receive units 71b, the second unit 70b bidirectionally communicating with another IR transmit/receive unit 75b which other unit comprises part of the I/O device 55b.

Referring to Figs 15(A) and (B), and to Figs 16(A)-(C), there are illustrated a number of ways in which a IR repeater transmit/receive unit 71b may be mounted in order to provide effective line of sight bidirectional communication between the computer 10b and the IR transmit/receive unit 75b of the I/O device 55b.

As illustrated in Fig 15(A) and 15(B), the IR repeater transmit/receive unit 71b comprises a pair of IR transmit/receive units 190b, 195b connectable by a cable 200b. The cable 200b has a plug 205b and a socket 210b provided at first and second ends thereof. The plug 205b may be received within a corresponding socket on a side wall of one of the pair of IR transmit/receive units 190b, while the other of the pair of IR transmit/receive units 195b provides a plug capable of being received by the socket 210b. In this way the pair of IR transmit/receive units 190b, 195b may be electrically connected together either directly or via cable 200b. As illustrated in Fig 15, if the IR repeater transmit/receive unit 71b is to be mounted through a wall then the cable 200b extends through the wall.

Referring to Fig 19 there is illustrated a schematic diagram of electronic circuitry provided in the IR repeater transmit/receive unit 71b. The first IR transmit/receive unit 190b of the pair comprises means for receiving signals 220, and means for transmitting signals 225. This unit further provides an amplifier 235, and a power source 240. The second unit of the pair provides means for receiving signals 250b from the I/O device 55b and means for transmitting signals to the I/O device 250b. The second unit further comprises an amplifier 260, and power source 265. The power sources 240, 265 may be a battery or mains or may, for example, include photocells 270 as illustrated in Fig 20(A), 20(B).

Referring now to Figs 21 and 22, there is illustrated a device 275 for testing the computer system 5a and 5b as hereinbefore described. The test device 275 comprises an IR receive unit 280 and means for detecting and displaying a set signal level received from an IR transmit/receive units comprising part of the computer system. As illustrated in Fig 21 the test device 275 in this embodiment is hand-held. The IR receive unit 280 is connected to an amplifier 280 which is connected to one input of a comparator circuit 290, the other input being connected to a set voltage reference level. The output of the comparator 290 is connected to a decoder 295, the output of which decoder 295 is connected to a control circuit 300, which control circuit 300 has two outputs 305, 310. The first output 305 is connected to a first LED 310 (for example, a red LED), the second output is connected to a further LED 315 (for example, a green LED). The test device 275 is powered by a power source 320, for example, in the form of a battery. The test device 275 further provides an on/off switch 325. The test device 275 may further provide on an external surface thereof a variable control 330 for altering the set reference level.

The test device may be used to assist in aligning various IR transmit/receive 70a, 69b, 70b, 71b units of the computer system 5a, 5b, and may further be used as an installation aid to seek to ensure that each IR transmit/receive unit 70a, 69b, 70b, 71b is transmitting signals above the set reference level. If on pointing the IR receive unit 280 at an IR transmit/receive unit 70a, 69b, 70b, 71b, an IR signal above the set level is received by the test device 275, then the green LED 315 illuminates. Otherwise the red LED 310 illuminates.

35

The embodiments of the invention hereinbefore described are given by way of example only, and are not meant to limit the scope of the invention in any way.

Particularly, it should be appreciated that the invention may provide a system which will provide a user friendly access to a remotely located PC, the power status of which is "standby" using a portable display unit with input capability, a cordless communication system using IR transmissions, an adaptor card using a serial data I/O port on the PC, and specially written supporting software providing a "menu driven" user interface.

It should further be appreciated that the invention may provide a system which allows the user to access a remotely located PC, this PC being quiescent, or on standby initially. An I/O device (the PAD I/O) is provided, which when activated, sends a signal, by wireless means, to power-up the PC (less the VDU, which is not required). The PC thus powered-up and recognising the PAD I/O commences a menu driven dialogue with the user by sending the MAIN MENU, to which the user responds by selecting one item thus presented. In this way the user has access to the computational power of the PC, its data bases, its mass storage devices - hard files, CD ROMS etc, and via a modem data bases such as INTERNET, and all its capabilities, eg, national newspapers.

It should also be appreciated that the invention may provide an adaptor card which will plug into a serial port on the PC, the I/Ps and O/Ps terminating in, in a first instance, a cable at the other end of which is mounted IR transmit/receive heads, and in a second instance a locally mounted IR transmit/receive head.

However, when the PC is designed from the outset to provide this facility, no adaptor card may be required, the necessary circuitry being built into the PC, and the IR transmit/receive heads could be incorporated into the

design of the computer casing in such a way as to optimise their propagation characteristics.

5 Further, it should be understood that serial data in the computer system of the present invention may be transmitted via normal communication encoding techniques, eg. LRC - modulus 10 or modulus 11.

CLAIMS

1. A computer system comprising a computer located in a first room of a building, at least one input/output (I/O) device located in a second room of a building and means for bidirectional communication between the computer and the at least one I/O device.
5
2. A computer system as claimed in claim 1, wherein the computer is a personal computer (PC).
10
3. A computer system as claimed in any preceding claim, wherein the building is a domestic residence.
4. A computer system as claimed in any preceding claim, wherein the communication means are at least partly wireless.
15
5. A computer system as claimed in any preceding claim, wherein the communication means use ultrasonic signalling means, RF signalling means and/or, Infra Red (IR) signalling means.
20
6. A computer system as claimed in any of claims 1 to 5, wherein an input/output port of the PC is connected to a cable which cable runs from the first room to the second room and is connected to an IR transmit/receive unit in the second room, which unit can bidirectionally communicate with another IR transmit/receive unit which other unit comprises part of the at least one I/O device.
25
30
7. A computer system as claimed in any of claims 1 to 5, wherein an input/output port of the PC is connected to a first IR transmit/receive unit in the first room which unit can bidirectionally communicate with a second IR transmit/receive unit in the second room via one or more IR repeater transmit/receive units, the second unit bidirectionally communicating with another IR
35

transmit/receive unit which other unit comprises part of the at least one I/O device.

5 8. A computer system as claimed in any preceding claim, wherein the PC is adapted to provide a standby (powered-down) mode and is capable of being remotely powered-up and powered-down via the at least one I/O device.

10 9. A computer system as claimed in claims 6 or 7 or claim 8 when dependent on claims 6 or 7, wherein the PC includes an expansion adaptor card connected to the input/output port.

15 10. A computer system as claimed in claim 9, wherein the adaptor card is provided with a battery.

20 11. An input/output (I/O) device adapted to form part of a computer system, the system comprising a computer located in a first room of a building, the I/O device which, in use, is located in a second room of the building and means for bidirectional communication between the computer and the I/O device.

25 12. An input/output (I/O) device as claimed in claim 11, wherein the I/O device is hand-held.

30 13. An input/output (I/O) device as claimed in either of claims 11 or 12, wherein the I/O device comprises a substantially planar body.

14. An input/output (I/O) device as claimed in claim 13, wherein the body is of substantially A4 size.

35 15. An input/output (I/O) device as claimed in any of claims 11 to 14, wherein the I/O device is provided with an LCD display which display may be colour or mono.

16. An input/output (I/O) device as claimed in claim 15,

wherein the LCD display may provide a touch sensitive input.

5 17. An input/output (I/O) device as claimed in any of claims 11 to 16, wherein the I/O device provides input means in the form of a trackball and an enter switch.

10 18. An input/output (I/O) device as claimed in any of claims 11 to 17, wherein the I/O device is provided with an IR transmit/receive unit.

15 19. A device for testing a computer system, the system comprising a computer located in a first room of a building, at least one I/O device located in a second room of the building and means for bidirectional communication between the computer and the at least one I/O device, wherein the communication means provides at least two IR transmit/receive units, the test device comprising an IR receive unit and means for detecting and displaying a set signal level received from one of the at least two IR transmit/receive units.

20 20. A computer system as hereinbefore described with reference to Figs 1 to 3 and 6, Fig 7, Figs 12 to 20(B).

25 21. An input/output (I/O) device as hereinbefore described with reference to Figs 4(A) and 4(B), Figs 5(A) and 5(B), Figs 8 to 11(D).

30 22. A device for testing a computer system as hereinbefore described with reference to Figs 21 and 22.



Application No: GB 9515579.2
Claims searched: 1-18

Examiner: Andrew Alton
Date of search: 24 September 1996

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.O): G4A: AKS, AFGDX; H4B: BK,BKX,BK22,BK24; H4L: LDA
Int CI (Ed.6): G06F: 3/02,13/38; H04B: 10/00,10/22,10/24
Other: Online databases: COMPUTER, INSPEC, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	GB 2288044 A	SONY - See Fig. 2 and page 4, line 27 to page 6, line 19	1-5,11-16, 18
X	GB 2282907 A	DATQUILL - See page 2, line 33 to page 3, line 16.	1,4,5,11 12,15
X	EP 0483549 A2	IBM - See Figs. 1a & 3 and col. 4 lines 7-22	1,2,4,5,11 12,18
X	EP 0369188 A2	TEXAS - See Fig. 1	1,2,4-7 11-13,15-16,18
X	EP 0176959 A2	BAUS - See Fig. 2 and abstract	1,4,5,11

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
& Member of the same patent family

A Document indicating technological background and/or state of the art
P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.

THIS PAGE BLANK (USPTO)